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THE RISK/RETURN PARADOX EXPLORED

by

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" The Risk/Return Paradox Explored"

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The purposes of this research paper are:

a) to re-examine a previous finding -- the risk/return paradox of a negative empirical association within industries of risk and return;

b) to explore one of the possible explanations for this finding -- that troubled companies take larger risks;

c) to consider some recent experimental evidence supporting the explanation -- that risk aversion is not ubiquitous and that individuals' performance and aspiration levels strongly color their treatment of risk;

d) to reconsider a research methodology which may help explore this issue -- the content analysis of annual reports in the context of a discriminant analysis of more & less profitable companies; and

e) to present some empirical evidence supporting the explanation -- that surrogate variables from three different industry studies support the idea that troubled companies take larger risks.

The Risk/Return Paradox

While doing some earlier work on the problems of corporate strategy within several industries it appeared that firms which were less successful and less profitable within the industries had higher variances in their operations and in their profits. Conversely, the more profitable firms seemed to have less variance over time in their profitability. Because at least on the surface this appeared to be inconsistent with much work and theory in economics and finance positing a positive correlation/association between risk and return, a rather thorough empirical examination of this association was undertaken and published as "A Risk/Return Paradox for Strategic Management." [8]

Just a few quotes from this earlier paper will introduce the ideas involved. From the literature for risk/return:

> . Caves in American Industry: Structure, Conduct, Performance states under the topic Risk Avoidance, "They (the managers) might go for the quiet life. This could mean that they avoid risky projects that could turn out to be very profitable, settling instead for a smaller but more certain profit." Later he says, "the evidence seems to show that equity capital does demand a somewhat higher rate of return where risks are higher -- where firms' fortunes vary wildly, or where profits fluctuate a lot from year to year." [9]
>
> . Armour and Teece in a Bell Journal of Economics article state, "Economic Theory suggests that the rate of return associated with a particular asset is a function of the risk inherent in the asset, and (assuming risk aversion) the greater the risk, the greater the expected return." [1]

Risk is the concept that captures the uncertainty, or more particularly the probability distribution associated with the outcome of resource commitments. The uncertainty exists before

the commitment of course, rather than afterwards -- though many outcomes are possible, only one is the result. In addition, though many activities are surrounded with uncertainty, e.g. political power in a less developed country, risk as ordinarily treated in the literature deals with the outcomes or results of resource commitments of the actor of interest, e.g.the corporate executive.

Though risk is therefore an ex ante concept, it must essentially be measured in actual empirical work ex post. Aggregating the results for these resource commitments will produce variance in returns (ex post) both cross sectionally and longitudinally. The effects and the aggregation of numerous commitments can only be observed over time. Other causes of variation in returns over time will also be mixed with the effects of the risks and will therefore confound the measurement problem.

The following are typical from the economics literature addressed to operationalizing risk:

> . Hurdle, in the Review of Economics and Statistics, explains, "Recent, numerous studies have tested the relationship between market structure and return...several of these authors have included a risk variable or a financial structure variable or both in a linear regression model. They have commonly represented the degree of risk by variability of profits over time." [14]

> . Solomon and Pringle state, "Firm risk...is defined as the standard deviation of the after-tax operating return of a typical (average-risk) project." [21]

> . Shepherd states in The Economics of Industrial Organization, "Yearly profit variance has become a standard index of such risk, especially for empirical tests." [20]

For return, typical ideas from the literature are:

> . Fisher and Hall explain in the Quarterly Journal of Economics, "The term profit as used here is probably equivalent to net business income, i.e. the difference between revenues and costs. To adjust for differences in firm size, profit is usually expressed as a percentage of some base.... Among the many possible measures, rate of return on net worth appears the most appropriate for studies of the risk-profit relationship." [12]
>
> . Hall and Weiss argue in the Review of Economics and Statistics, "We prefer the rate of return on equity to that on total capital, partly because this is the profit rate reported in Fortune, but also because it seems theoretically correct. It is what managers acting in the owners' best interests would seek to maximize." [13]

Much of modern finance theory in the discussion of the Capital Asset Pricing Model (CAPM) deals with capital markets and market investors rather than the firm itself. Risk in this literature deals with the variance in returns to the market security investors and is separated into the systematic risk component which is correlated with the general market and the residual (unsystematic) component which is not correlated with the general market, and which may therefore be diversified away.

Though in the original Paradox paper an attempt is made to "place" its findings largely outside of the CAPM domain, several comments from the paper, "The Association Between Market Determined and Accounting Determined Risk Measures" by Beaver, Kettler and Scholes may be relevant. [2] "The evidence supports the contention that accounting measures of risk are impounded in the market-price based risk measure. There is a high degree of contemporaneous association between the accounting and market risk measures."

This statement would suggest that not only for risk analysis for the firm itself, but even for stock market analysis,

accounting measures might be relevant. However, in citing another study, the question is implicitly raised whether market measures of risk will continue to be of major import, "King's study of monthly security returns [16] found that, on the average, approximately 52 percent of the variation in an individual security's return could be explained by its comovement with a marketwide index of return. The percentage has been secularly declining since 1926 and for the final 101 months of the study (ending with December 1960), the proportion explained was 30 percent."

Given this background of risk/return definition and the anticipated positive association between risk and return, the paradox follows. The empirical results from the first two industries that we had been studying indicated that the higher-average-profit companies tended to have lower risk, i.e.variance over time. See Figures 1A and 1B for the results.

Figure 1A

Food Processing Industry Companies

		ROE Variance High	ROE Variance Low
$\overline{ROE}$	High	9	14
	Low	14	9

Figure 1B

Minicomputer/Peripheral Industry Companies

		ROE Variance High	ROE Variance Low
$\overline{ROE}$	High	3	20
	Low	20	3

The number of companies shown in each quadrant of the two by two contingency tables is based on each company's average profit and the variability of its profit over the five-year period, 1972 to 1976. (The split between "High" and "Low" simply divides the total data set in half for both rows and columns, and the null hypothesis that there is no association calls for equal numbers in each of the four quadrants.)

Two much larger and more complete tests were made of these first checks. All industries from the set of eighty-five covered by Value Line, and including 1572 companies have been analyzed for a nine year period (1968-1976). Of this total set of eighty-five, fifty-six support the hypothesis (statistically significant beyond 0.001), twenty-one refute it, and eight are ties. (See the Paradox paper for more data and results for each industry).

In addition Michael Treacy [22] replicated this test with even stronger results using the Standard and Poor Compustat database with 54(2 digit SIC code) industries, 1458 companies, for the 10 year period 1966-1975. His methodology, rather than 2 x 2 tables, was rank order comparisons ala Spearman correlations, including and controlling for a third variable, size of firm as measured by average assets. Forty-three of the 54 industries had a correlation coefficient that was negative, about 80% for the paradox, and controlling for size only drops the number of negative partial correlations from 43 of 54 to 39 of 54.

Many possible explanations/speculations for the paradox findings were given in the earlier paper. They included (briefly here):

(1) Strategy -- good strategy may simultaneously deliver higher profits and lower variance.

(2) Real Income Smoothing -- by judicious placement in time of expenditures and generic investments income may be smoothed (and increased).

(3) Artificial Income Smoothing -- Profitable companies may have the luxury of "moving" accounting profits between periods in order to smooth the result.

(4) Risk preference -- Under some conditions certain people or institutions may prefer a higher risk coupled with a lower expected profit. This is the opposite of the normally assumed risk/avoidance, risk/averse pattern -- illustrated by State Lottery tickets -- and a major thrust of this current paper.

(5) Good Management -- somewhat like good strategy, management in any of its manifestations may affect both profits and real risks.

(6) Biased perceptions -- Frank Knight, Risk, Uncertainty, and Profit (1921) remarked, "To this bias must be added an inveterate belief on the part of the typical individual in his own 'luck', especially strong when the basis of the uncertainty is the quality of his own judgement."

(7) Push/pull of less profitable firms -- less profitable firms are drawn to higher risks -- as number (4) above, the heart of this current paper.

(8) Planners & Planning -- Igor Ansoff in some empirical work demonstrated that having planners associated with acquisition and merger activities led to more profitable company experience (and one would think fewer system shocks).

(9) Particular Behavior -- prior research indicated that a value added focus, strong customer orientation, active international business, and corporate social responsibility, all were associated with higher profits and probably lower profit variance.

(10) Research artifacts -- Profit upperbounds as asymptotes, or "survivor" company statistics might possibly have a minor effect on the paradox results. Analysis showed that neither size nor leverage had an effect.

One choice of questions and answers among several worthy of exploration is the following: Do low profit (troubled) companies take more risks? Or do companies which take more risks

become low profit (troubled) companies? This paper explores the first possibility through some experimental evidence from Stanford and Duke, and from some annual report content analysis we have done.

Duke and Stanford Experiments

Daniel Kahneman and Amos Tversky summarize their Econometrica paper, March 1979, "Prospect Theory: An Analysis of Decision Under Risk" as follows [15]:

"This paper presents a critique of expected utility theory as a descriptive model of decision making under risk, and develops an alternative model, called prospect theory. Choices among risky prospects exhibit several pervasive effects that are inconsistent with the basic tenets of utility theory. In particular, people underweight outcomes that are merely probable in comparison with outcomes that are obtained with certainty. This tendency, called the certainty effect, contributes to risk aversion choices involving sure gains and to risk seeking in choices involving sure losses (emphasis added). In addition, people generally discard components that are shared by all prospects under consideration. This tendency, called the isolation effect, leads to inconsistent preferences when the same choice is presented in different forms. An alternative theory of choice is developed, in which value is assigned to gains and losses rather than final assets -- and in which probabilities are replaced by decision weights. The value function is normally concave for gains, commonly convex for losses (emphasis added), and is generally steeper for losses than for gains. Decision weights are generally lower than the corresponding probabilities, except in the range of low probabilities. Overweighting of low probabilities

may contribute to the attractiveness of both insurance and gambling."

These findings are the result of numerous controlled experiments with students and University faculty at Stanford University and at the University of British Columbia. The same authors describe their experimental evidence and theory in a more accessible article in Science, (30 January 1981). [23] Several more quotations from Science should give the essence of their work:

p. 454, "The Framing of Acts. Problem 3 (N=150): Imagine that you face the following pair of concurrent decisions. First examine both decisions, then the options you prefer.

Decision (i). Choose between:

A. a sure chance of $240 (84 percent subject response)

B. 25% chance to gain $1000, and 75% chance to gain nothing (16% subject response).

Decision (ii). Choose between:

C. a sure loss of $750 (13 percent subject response)

D. 75% chance to lose $1000, and 25% chance to lose nothing (87% subject response).

The majority choice in decision (i) is risk averse: a riskless prospect is preferred to a risky prospect of equal or greater expected value. In contrast, the majority choice in decision (ii) is risk taking: a risky prospect is preferred to a riskless prospect of equal expected value."

p. 456 "The Framing of Outcomes. Outcomes are commonly perceived as positive or negative in relation to a reference outcome

that is judged to be neutral. Variations of the reference point can therefore determine whether a given outcome is evaluated as a gain or as a loss. Because the value function is generally concave for gains, convex for losses, and steeper for losses than for gains, shifts of reference can change the value difference between outcomes and thereby reverse the preference order of options....Consider a person who has spent an afternoon at the race track, has already lost $140, and is considering a $10 bet on a 15:1 long shot in the last race. This decision can be framed in two ways, which correspond to two natural reference points. If the status quo is the reference point, the outcomes of the bet are framed as a gain of $140 and a loss of $10. On the other hand, it may be more natural to view the present state as a loss of $140, for the betting day, and accordingly frame the last bet as a chance to return to the reference point or to increase the loss to $150. Prospect theory implies that the latter frame will produce more risk seeking than the former. Hence, people who do not adjust their reference point as they lose are expected to take bets that they would normally find unacceptable. This analysis is supported by the observation that bets on long shots are most popular on the last race of the day....These observations highlight the lability (plasticity, instability) of reference outcomes, as well as their role in decision making. In the examples discussed so far, the neutral reference point was identified by the labeling of outcomes. A diversity of factors determines the reference outcome in everyday life. The reference outcome is usually a state to which one has adapted; it is sometimes set by social norms and

expectations; it sometimes corresponds to a level of aspiration, which may or may not be realistic."

In the second experimental study reported for this "paradox explored" paper, Dan Laughhunn, John Payne, and Roy Crum summarize their Management Science paper, "Managerial Risk Preferences for Below-Target Returns" [17], as follows, "This paper reports on the risk preferences for below target returns of 224 managers from U.S., Canada and Europe. When only non-ruinous losses were involved, 71% of the managers were risk seeking for below target returns. (emphasis added) The distribution of risk preferences tended to be stable over a wide range of experimental conditions: diversity of background of the managers, the size of outcomes below target, and the content of the decision process (personal versus managerial). When ruinous losses were introduced for 75 managers, 64% switched to risk averse behavior. Empirical findings concerning the relationship between risk preferences for below target returns and several demographic characterisitics of managers are also reported."

Their experiments were performed with subjects composed of five groups of business managers from 53 different firms across four different countries. Their findings are statistically robust (as are the Stanford and British Columbia studies), and the reader is referred to the Management Science article and the subsequent MS Note [18] for the more detailed experimental procedures and findings.

Both of these recent experimental studies strongly demonstrate that risk aversion is not ubiquitous, but rather that

in troubled situations risk preference is observed in individual behavior.

Methodology

Several different methods are suggested as means to answer the question whether troubled companies take more risks than their more successful peers. Puzzles to be resolved preliminary to much of the work would include the designation of satisfactory surrogate variables for both measures of success (or conversely trouble) and especially for measures of risk. In addition, the question of relevance of the nature and level of aggregation of the actors would have to be addressed. One individual deciding for himself may not be the same thing as a company "deciding" for itself. Also, 30 (temporary) students deciding collectively may not be comparable to 30 (permanent) managers deciding collectively.

Possibilities of methodologies are:

(1) Live-in observation - Ethnography and cultural anthropology have their defenders even in Business Schools. The trade off is essentially between time/cost consumption and "realness" of the data/findings. "Presentational" information is what insiders tell outsiders in response to questions (and is not be be believed).

(2) Ask - Perhaps the most typical methodologies in behavioral science today are interviews and questionnaires. Sophisticated clinical design may guard against egregious errors, but "observer-effect" is hard to eliminate.

(3) Experiments - Laboratories of/for subjects can be designed to reveal many interesting findings. Both the Duke and the Stanford work cited earlier falls in here. Comparability to the real world and generalizability almost always remain a question.

(4) Survey - Typical of much work in economics, data are available at various levels of aggregation which frequently serve the purpose of an investigation. The government is a major requester/supplier of such survey data. Sutton's work cited elsewhere [8] is an example, which may often only weakly test the major questions asked.

(5) Content analysis - Communications, both oral and written, may be treated by coding and association to reveal underlying patterns. At the extreme such observation may be of non-verbal behavior (e.g. eye blinks). Annual report content analysis is the method described below.

(6) Anecdotes - Individual situations may closely map the major questions addressed. This is a frequent mode for journalists and magazines. For explanation and illustration they are valuable. Maybe for initial expanding of questions and idea generation they are useful, but for objective "answering" of questions they are suspect, and too subject to bias and enthusiasm.

Content Analysis

Since content analysis will be the method employed here, our previous use of this approach will be described in some detail. Our content analysis actually followed from a request from the MIT Corporation (the trustees) to the author.

At the time of many protests, 1969 and 1970, in our society, Campaign GM and other stockholder proxy proposals ended up on the table of Investment Committees of University Boards of Trustees. The advocate groups wanted the University stock holdings voted their way. Several studies were done for and within Universities and ours was entitled, "University Investing and Corporate Responsibility." [4] The report dealt with how to think about what securities might be purchased and owned, how to react when issues arose about those securities, and how the university might be organized to address these issues. It is interesting in retrospect to see how closely this maps a current view of the field of corporate strategy, i.e. domain choice, interaction with the domain, and internal adjustment derivative from these choices.

Subsequent interviews (one of the mentioned methodologies -- "Ask") with European managers and institutional investors were followed by more papers and more questions. The food processing industry was selected to investigate the possible linkage between corporate social responsibility and profitability.

Corporate Social Responsibility is an extremely difficult thing to measure. We chose to do a content analysis of annual reports, (all content analysis is performed independently by at least two coders) measuring the percentage of the reports which dealt with issues of Corporate Social Responsibility (about a hundred firms from Moody's Industrial Manual, 1973).

From California Management Review, [5] "While wishing to give the reader some feel for the many kinds of issues discussed in the

food-processing industry annual report, and our sometimes difficult coding choices, perhaps an example will suffice. The following paragraphs are found in the chief executive officer's letter to the shareholders at the beginning of the annual report of a large company. The first paragraph was not coded as "corporate social responsibility" discussion, while the second one was so coded:

> "The history of (company), in particular, successfully refutes the arguments of the protectionists. We do not import finished goods produced abroad, and certainly do not exploit low-cost labor. We help the U.S. balance of payments by selling in markets we could not reach without building or buying foreign facilities to serve those markets. The jobs we create abroad do not affect American employment, since our export potential from the U.S. is limited by freight cost, different labeling and ingredient requirements, and high import duties and import quotas."

> "The other issue of public interest has to do with what we call public service and is discussed in detail in the section of this report headlined under that name. In every area of reasonable public challenge -- for environmental improvements, for better nutrition, for grants and gifts, for equal opportunity, for whatever seemed appropriate in an impatient age -- we responded sympathetically and quickly to the best of our abilities...."

Most annual report discussions were actually easier to code than these two paragraphs. Though it is difficult to give the full flavor of the corporate social responsibility (CSR) coding process, we were attempting to identify discussed efforts to either increase positive potential externalities or decrease negative potential externalities -- to increase apparent social benefits or decrease apparent social costs.

Two tests, not to be described in detail here (see Strategy and the Weather) [6], were made to check the idea of using annual report discussion as a measure of real corporate activity.

A professional student of corporate responsibility had publicly identified 14 stars in the field. We selected 14 peers (industry, size) for matched pairs, and investigated the 28 annual reports (not the food industry -- our study). The stars had substantially (statistically significant at 0.017) more annual report discussion than the matched pair neutral random companies, (Median 4.8% vs. 1.7%).

A further check looked at international business. About 50 companies in the food industry had Standard and Poor sheets which usually give the percentage of the company's business which is internationally based. These companies could then be rank-ordered by this percentage. The same companies were independently (earlier) content analyzed for the percentage of the annual report discussion given to their international business, and rank-ordered by this statistic. The two rank orders, tested by the Spearman Correlation coefficient, were highly similar (significance at 0.001).

The two tests suggest that within some reasonable bounds annual report discusssion mav correspond to real activity.

A further study of the food industry [6] was undertaken to reveal a number of characteristics which appeared to discriminate the more profitable companies from the less profitable companies. One facet of this study compared material in the reports of the highest profit quartile companies to the lowest profit quartile companies. One outcome of this study will be cited later under "Findings."

Several of the food industry findings are worth noting here. With Methodology I which was a complete coding of the 82 annual

reports for Corporate Social Responsibility it was determined that the set of companies with a high involvement had a 5 year average return on investment of 14.7%, and the set of companies with a low rate of involvement in Corporate Social Responsibility activities had a 5 year average return on investment of 10.2% (a difference significant beyond 0.01).

With Methodology II which involved an accumulation of quotations from the top quartile companies and the bottom quartile companies for a special qualitative type of discriminant analysis , topic-by-topic, the following topic which gave the title to the paper "Strategy and the Weather" is quoted:[6]

"1. Food processing companies that are less successful complain about the weather.

There were many (seven) different comments mentioning unfavorable weather conditions in the low-quartile companies and no mention in the high-quartile companies (and it should be repeated that the ROE figure which separates the company quartiles is an average for five years).

> "The (Name) Division shares industry concern this year over the severe and unusual weather that punished major growing areas and is causing some disruption in crop yields." (4th Quartile)
>
> "...continued wet weather during the last season delayed harvesting and caused increased raw product expense due to the need for additional drying." (4th Quartile)
>
> "The primary earlier factor contributing to the poor results was the adverse weather condition experienced in the states of Arkansas and Mississippi where the Company plants are located." (4th Quartile).
>
> "Unusually heavy rainfalls in Central Arizona and in the Salinas Valley caused the loss of a large part of the Arizona spring lettuce crop, and inhibted planting of Salinas Valley lettuce furing the winter months." (4th Quartile)

"...Group showed a decline in earnings due principally to the effects of a severe blowdown suffered in the (Honduras) Division." (4th Quartile)

"The thesis could be advanced that companies with less satisfactory results complain. More likely, it is that their basic business puts them in a situation which is more vulnerable to the occasional and persistant vagaries of the weather, (and that their complaints are justified). If the business is a "commodity"business, with little "value added," there will be little margin or flexibility to cope with supply difficulties."

A completely different study was performed several years later of the computer peripheral,mini-computer industry. [7] Both content analysis and more straightforward numerical information from the annual reports were used to discriminate, and, in a loose sense, explain the differences between the more profitable and the less profitable companies. A facet of this study will also be cited later for the present study.

One finding from the dozen explored in the mini-computer industry may give a better sense of the potential of content analysis:

"Customer orientation. A free enterprise economy presumes that commercial success is a function of an appropriate responsiveness to the customer -- what product or service he wants, needs, and is willing to pay for. A strong consciousness of the customer by the company is one signal of this strategic responsiveness. One of the most thorough pieces of research which demonstrated this concept was Project SAPPHO, [19] which investigated matched pairs of industrial innovation success -- twenty-nine successful situations versus twenty-nine

unsuccessful situations. While a number of variables helped discriminate between these two outcomes, the strongest explanatory variable was the presence or lack of a strong customer orientation.

Customer Orientation is captured by the surrogate variable here of the number of times the word "customer," "client," or "user," or the name of a particular customer, client, or user is given in the prose of the annual report, divided by the total number of lines in the report, (given as a percentage). This "content analysis" is used as a signal of the strength of the customer orientatio of the company." See Table 2 for the computer industry.

Table 2. Customer orientation

			Explanation
Low (15)	Medium (16)	High (15)	Companies ranked by industry thirds
(0.5-2.9)	(3.1-7.7)	(9.3-24.0)	Surrogate variable ranges
2.8%	5.5%	8.6%	Median of 3 year return on sales for the company sets

(Statistical significance using a binomial matched pair comparison test: 0.034.)

In other words, the third of the companies with the most mention of customers -- up to 24% of their annual report lines, had on the average three times the profit as the third of the companies with the least mention of customers -- down to half a

percent of the lines. Though there is usually the question of the direction of cause and effect in studies such as this, it would seem difficult to make the contrary argument that companies after they become highly profitable and successful then think intently about their customers.

Findings

The experiments from Stanford (Tversky et.al.) and Duke (Laughhunn et.al.) show that individuals who are placed in an unfavorable situation, e.g. loss or less than aspiration levels, make choices which are consistent with risk preference and not risk aversion. They will take a smaller expected value accompanied by a wider variance in a risky choice. They do this on the possibility they may "come out even", i.e.eliminate the loss or meet the previously established aspiration level.

These experiments refute the common assumption of many students of economics and finance of ubiquitous risk aversion. Might this also be true of groups of individuals deciding jointly, and of industrial corporations?

Three findings from annual report content analysis from three different industry studies suggest this possibility, i.e. that troubled companies take bigger risks. The first two studies come from previous work. The third was performed for this paper.

1) A study of the food processing industry [6] composed of 82 companies had revealed a number of differences between the less profitable companies and the more profitable companies. One of these differences was activity in acquisitions (and a minor amount of divestments not separately coded). Acquisitions

ordinarily involve substantial risks, even if well planned, and are not uncommonly unsuccessful. It seemed, therefore, that the rate of acquisitions might be used as an indication of risk preference rather than risk aversion of the firm.

Those companies with a high rate of acquisition and divestment activity (not separately coded) had a five year average return on investment of 8.9%. Those companies with a low rate of acquisition and divestment activity had a return of 12.8%. There is at least a partial time sequence in these findings as the ROE is averaged over the previous five years, while the annual report coding is from the current report, and there is a positive association between previous low profitability and the risky business of acquisitions.

2) A study of the computer peripheral industry [7] composed of 46 companies had also revealed a number of differences between the less profitable companies and the more profitable companies. One of these differences was the amount of litigation exposure discussed in the footnotes to their financial statements in the annual reports. For a public company the Certified Public Accountants who audit the reports will require that litigation exposure which may have a material present and future effect on profits must be revealed/discussed in the annual report. Litigation, of course, can be a result of many things, but it can include the results of a firm pushing too hard against the civil or public constraints of the law -- a form of risk seeking.

Those companies with no (zero) litigation exposure discussion in the footnotes to their financial statements in the annual reports had a median profit (return on sales) for 3

years of 6.2%. Those companies (10 of 46) with some discussion of litigation exposure in their financial footnotes (2.3% to 30.5% lines of total lines in annual report) had a median return of 0.9%, barely breakeven, (Statistical significance using a binomial matched pair comparison test: 0.034).

Once again, there is at least a partial time sequence in these findings as the low profitability is from the previous three years and the annual report content analysis is from the current report, and results show a positive association between low profitability and a surrogate measure of risk, litigation.

3) The new study involved the container industry(as listed by Value Line in 1976). The annual reports had been obtained for an earlier study, and then not used. The 27 companies were arranged in rank order of profitability (median ROE for previous 5 years). The top quartile and bottom quartile, as in the previous food industry study, were chosen for analysis -- 7 companies each, (i.e. the middle half are excluded.)

For this third industry to be used as a source to answer the question whether troubled low profit companies might not be risk seeking rather than risk averse, a third surrogate variable was necessary. It seemed possible that new activities, new approaches, new ventures might connote such attitudes and behavior. The president's letter at the beginning of each report was therefore coded for the word "new" which can be associated with risky and unknowable things. New is then to be used as a surrogate for risk preference rather than risk aversion (and was

the only test made). The results follow:

Bottom quartile

	Company (low profit)	Median 5 yr. ROE	"New" count
1)	American Can*	9.8%	6
2)	Bemis	9.2%	4
3)	Dorsey	6.1%	0
4)	Fibreboard	1.4%	6
5)	Rexham	6.9%	11
6)	Rust Craft	8.1%	9
7)	Saxon	5.6%	4
	Median	6.9%	Median 6

Top quartile

	Company (high profit)	Median 5 Yr. ROE	"New" count
1)	American Greeting	14.8%	0
2)	Clevepak	15.2%	10
3)	Crown Cork & Seal**	14.2%	1
4)	Inland Container	15.9%	1
5)	Lenox	15.5%	2
6)	Nashua	14.7%	5
7)	Stone Container	14.8%	2
	Median	14.8%	Median 2

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* Students of Cyert& March[11] will recognize the fading star from the duopoly studies. Continental Can (now Group) was in the middle half with a 5 year median ROE of 12.7% and a "new" count of 2 -- a top quartile profile.

** Students of Christensen, Andrews, & Bower's [10] policy and strategy cases will recognize the continuing success of Mr. Connelly's company.

While of couse the sample is small, and the variance in the sample appreciable, the whole data set is available for the reader to see the results. Having come through five years of substandard results in this (Value Line defined) industry, the bottom seven companies now speak of new activities/ventures/ things substantially more than the top seven companies.

Afterthoughts

One explanation for the apparent paradox of negative association between risk and return within industries, as measured in these earlier studies, may be that troubled companies take larger risks.

The Duke and Stanford experimental studies of individuals support the general notion of risk preference at the bottom end of a scale for most people. We are not everywhere risk averse. People put in loss situations, or below aspiration levels, may choose higher risks coupled with lower returns.

Many modes of analysis and investigations are available to the academic community to determine if or where the experimental-individual results can be carried over into the world of corporate organization behavior.

Three initial tests of available annual reports were made to examine the associations between low profit troubled companies (a relatively easy and non-controversial set to identify) and risk preference. It is this latter variable which is operationally troublesome, which opens up the field for the choice of surrogates. Three surrogates, acquisitions, litigation, and newness were all shown to be positively associated with

troubled companies. These initial tests support the experimental evidence. Troubled companies apparently take more risks thus contributing to the negative empirical association between risk and return.

It is perhaps too early to draw many conclusions from this work. However, a number of interesting questions may be raised. For the scholar, early work of half a century ago (Berle and Means) [3] noted the separation of corporate ownership from corporate control. Newer work (Williamson) [24] has added to our understanding of this potential separation. Will new evidence of risk preference at the lower end of the scale for corporations and their managers throw new light on the potential conflicts of interest between owners and managers?

Since most normative or prescriptive work in the management literature seems to assume either explicitly or implicitly the idea of risk aversion, perhaps some new developments are called for. If advice is to be given to the manager, are his target levels to be relevant ones? If he is risk seeking below those target levels (perhaps at zero profit), are the algorithms and heuristics to be designed to help him go for the long shots? To operationalize one particular case, M.R.P. (materials requirement planning) programs would have to incorporate existential probability and utility functions.

If public policy in these times of increasingly difficult international competitition seeks to encourage innovation, can troubled companies'risk seeking be exploited? Evidence seems to support the idea that innovation may belong to the field of the social outlier. Should laws, taxes, and administrative policy somehow support the risk seeking of the troubled company? Is this a positive externality that has somehow been missed?

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